UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/576,266	05/24/2000	MAGNUS HELLSTRAND	51706-59853-HJ/HG	5255

466 7590 01/26/2006

YOUNG & THOMPSON
745 SOUTH 23RD STREET
2ND FLOOR
ARLINGTON, VA 22202

EXAMINER	
YODER III, CHRISS S	
ART UNIT	**PAPER NUMBER**
2612	

DATE MAILED: 01/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/576,266	HELLSTRAND, MAGNUS	
	Examiner	Art Unit	
	Chriss S. Yoder, III	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *10-13,27-29,32 and 35-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-13 and 27-29* is/are allowed.

6)☒ Claim(s) *32, 35-42, and 47-62* is/are rejected.

7)☒ Claim(s) *43-46* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 June 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed November 2, 2005 have been fully considered but they are not persuasive.

Applicant argues, with respect to claims 37 and 62, that the references do not disclose the recited combination of a coarse focusing step using only a first range of spatial frequency components of the image using a hill-climbing technique, followed by a fine focusing step that uses only a second range of spatial frequency components of the image higher than those of the first range, using a curve fitting technique by adapting a mathematical function and calculating a maximum value of such function. However, Xie does disclose a coarse focusing using only a first range of spatial frequency components of the image using a "hill-climbing" technique (column 2, lines 5-21; and figure 5; A is considered the "curve-fitting" and B is considered the "hill-climbing"), and after the coarse focusing step, performing a fine focusing using only a second range of spatial frequency components of the image, the second range being higher than the first range and the fine focusing step uses a "curve-fitting" technique comprising adapting a mathematical function and calculating a maximum value of said function (column 2, lines 5-21; and figure 5; A is considered the "curve-fitting" by using the mathematical function of averaging to calculate the maximum focus value, and B is considered the "hill-climbing").

Applicant argues, with respect to claim 56, that the references do not teach or suggest an automated focusing function by specifically choosing to direct the focusing

efforts on that portion of the overall scan which represents a specified temperature and that the identification of a highest temperature region of an optical scan provides no teaching or suggestion of an automated focus technique that focuses on the temperature identified region. However, Suda teaches the selection of an imaging window that is used to automatically focus an image (column 3, lines 57-65 and column 7, lines 31-36; the automatic focusing means uses the calculating means to determine the difference information), and Williams teaches the identification of a region based on the temperature (column 5, lines 33-37; using the detection of a "hot spot" and the calculated location within the imaging area as the signal output to the processor of Suda in order to control optical convergence element). Therefore, by combining the two references the Williams device can be used to select the imaging window of Suda based on the temperature.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

Claim Objections

Claim 42 is objected to because of the following informalities:

Claim 42 recites the limitation of "the device is constructed and arranged to perform of the relation between at least two of the following parameters", however, the examiner believes this limitation should read: "the device is constructed and arranged to perform ***semi-automatic or fully automatic calibration*** of the relation between at least two of the following parameters", and will be examined as understood by the examiner.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 32, 35-41, 47, 50, 52-55, and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al. (US Patent # 6,088,060) in view of Williams et al. (US Patent # 6,281,970) and further in view of Xie et al. (US Patent # 5,874,994).

2. In regard to claim 37, note Suda discloses the use of an optical apparatus (column 7, lines 16-19; and figure 1: 1), a controllable optical convergence element (column 7, lines 16-19; and figure 1: 8), an image detector arranged so as to receive an image of an object projected by the optical convergence element and to generate an image signal based on the received image (column 1, lines 40-43 and column 5, lines 1-5; and figure 1: 2), a processor arranged so as to receive signals from the image detector and to generate control signals to control the optical convergence element to focus the image of the object onto the image detector (column 7, lines 16-19; and figure 1: 5, 10, and 7), wherein the processor is constructed and arranged to generate the control signals based on selected components of said image signal from the image detector that represent at least one image window in the image using an iterative

process (column 3, lines 57-65 and column 7, lines 31-36; the automatic focusing means uses the calculating means to determine the difference information; and figure 9a shows the iterative process of detecting a focusing window).

Therefore, it can be seen that the Suda device fails to operate in the infrared range and that the iterative process comprises the steps of performing a coarse focusing using only a first range of spatial frequency components of the image using a "hill-climbing" technique, and after the coarse focusing step, performing a fine focusing using only a second range of spatial frequency components of the image, the second range being higher than the first range, and the fine focusing step using a "curve-fitting" technique comprising adapting a mathematical function and calculating a maximum value of said function.

Williams discloses the use of an imaging device that captures images in the infrared range (column 2, lines 35-40). Williams teaches that the use of an infrared sensor can be used to detect differences in thermal properties to detect heat such as forest fires in order to observe and research the specific hotspot (column 2, lines 36-47). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the use of an infrared sensor and sensor instrumentation as suggested by Williams.

Xie discloses the use of an image focusing apparatus that uses an iterative process that comprises the steps of performing a coarse focusing using only a first range of spatial frequency components of the image using a "hill-climbing" technique (column 2, lines 5-21; and figure 5; A is considered the "curve-fitting" and B is

considered the "hill-climbing"), and after the coarse focusing step, performing a fine focusing using only a second range of spatial frequency components of the image, the second range being higher than the first range and the fine focusing step uses a "curve-fitting" technique comprising adapting a mathematical function and calculating a maximum value of said function (column 2, lines 5-21; and figure 5; A is considered the "curve-fitting" by using the mathematical function of averaging to calculate the maximum focus value, and B is considered the "hill-climbing"). Xie teaches that the use of coarse and fine focusing functions that are based on low frequency and high frequency ranges is preferred in order to increase focusing response time without sacrificing precision (column 1, lines 23-25). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Suda device to include the use of an iterative process that comprises the steps of performing a coarse focusing using only a first range of spatial frequency components of the image, and after the coarse focusing step, performing a fine focusing using only a second range of spatial frequency components of the image, the second range being higher than the first range as suggested by Xie.

3. In regard to claim 32, note Xie discloses the use of the variable iterative process is selected based on frequencies of the image (column 2, lines 5-21).

4. In regard to claim 35, note Williams discloses the detection of an area of the image that is based on the identification of a portion of the image representing a highest temperature (column 3, lines 55-56; the hotspot is considered to be the highest temperature).

5. In regard to claim 36, note Williams discloses the detection of an area of the image that is based on the identification of a portion of the image with respect to the temperature (column 3, lines 55-56; the hotspot is considered to be the highest temperature), although Williams does not explicitly disclose that the portion of the image is selected based on the lowest temperature, it is merely a matter of design choice (for instance, in the Williams reference, the device is searching for a fire, so based on design choice, if the user wanted to search for an iceberg, it would be an obvious modification to change the temperature range based on the preference of the user in order to select the lowest temperature region). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Williams device to search for the lowest temperature based on design choice.

6. In regard to claim 38, note Suda discloses that the processor performs the iterative process on at least one image window in the image, the image window representing less than an entirety of the overall image (column 3, lines 57-65; the automatic focusing means uses the calculating means to determine the difference information; and figure 9a shows the iterative process of detecting a focusing window).

7. In regard to claim 39, note Williams discloses that the sensor instrumentation monitors predetermined temperature differences or changes (column 15, lines 1-4; while scanning the image, it is monitoring for predetermined levels).

8. In regard to claim 40, note Williams discloses a computer connected to the radiometer (figure 8: 184 and 200; this is considered to be the equivalent to a radiometric calibration device, which sets the temperature levels to scan for).

9. In regard to claim 41, note Williams discloses sensor instrumentation and a calibration device, which are used to monitor predetermined temperatures differences or changes in the image (column 7, lines 32-38; and column 15, lines 1-4).

10. In regard to claim 47, note Suda discloses that the device identifies the image window by further comprising a movement detection device that enables focusing on moving objects, whereby the focus window is movable across the image and follows the moving object in the window during focusing (column 7, lines 32-36 and figure 4; the image focusing device detects movement and follows the movement in the image plane).

11. In regard to claim 50, note Suda discloses the selection of focusing areas (column 7, lines 32-35) and Williams discloses that the selection of areas is based on temperatures (column 3, lines 55-59), while leaving out the areas where processing is not needed in order to reduce the processing required (column 3, lines 55-59; the device only selects the hotspots which and the areas which are not desired are not used; therefore, by combining the two references, the selection of the focus position can be selected based on the temperature and omit image analysis in impossible intervals).

12. In regard to claim 52, note Williams discloses the use of a pan-tilt device that controls a repeated sequence within the viewed area (figure 1a: the nutation and direction of scan show a repeated sequence of movements).

13. In regard to claim 53, note Williams discloses that the computer stores the topographic map of the viewed area (column 6, lines 62-66; and figure 8: the computer stores the terrain map), and using this map to focus on specific areas of the viewed

area (this map is considered to be focus data since this map contains distance information that it is used for focusing).

14. In regard to claim 54, note Suda discloses the use of an automatic zooming device (column 7, lines 16-19; and figure 6: 1 and 9).

15. In regard to claim 55, note Williams discloses the use of GPS to calculate the position of the viewed objects and presents positions of viewed objects relative to positional data from the position determining device (column 1, lines 15-30; column 4, lines 1-14; and figure 11: 37 and 252).

16. In regard to claim 62, this is a method claim, corresponding to the apparatus of claim 37. Therefore, claim 62 has been analyzed and rejected as previously discussed with respect claim 37.

17. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al. (US Patent # 6,088,060) in view of Williams et al. (US Patent # 6,281,970) and further in view of Xie et al. (US Patent # 5,874,994), and in further view of Sato et al. (US Patent # 5,861,915).

18. In regard to claim 42, note the primary reference of Suda in view of Williams and Xie discloses the use of an image analyzing focusing device as claimed in claim 37. Therefore, it can be seen that the primary reference fails to disclose the automatic calibration of the relation between temperature of the optics and the focus position of the optics. Sato discloses the automatic calibration of the relation between temperature of the optics and the focus position of the optics (column 5, lines 49-52; and figure 1: 5,

13, and 41). Sato teaches that the automatic calibration of the relation between temperature of the optics and the focus position of the optics is preferred in order to compensate for defects caused by differences in temperature (column 4, lines 30-36). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the automatic calibration of the relation between temperature of the optics and the focus position of the optics as suggested by Sato.

19. Claims 48 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al. (US Patent # 6,088,060) in view of Williams et al. (US Patent # 6,281,970) and further in view of Xie et al. (US Patent # 5,874,994), and in further view of Kaneda (US Patent # 6,246,437).

20. In regard to claim 48, note the primary reference of Suda in view of Williams and Xie discloses the use of an image analyzing focusing device as claimed in claim 38. Therefore, it can be seen that the primary reference fails to disclose the use of geometric shapes to find the image window to focus. Kaneda discloses the recognition of geometric shapes to find the image window to focus (column 8, lines 20-23). Kaneda teaches that the use of geometric shapes to determine the focus area is preferred in order to compensate for vibrations (column 8, lines 52-55). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the use of geometric shapes to determine the focus area as suggested by Kaneda.

21. In regard to claim 49, note Kaneda discloses the recognition of geometric shapes to find the image window to focus the storage of the geometric shapes (column 8, lines

20-23). Although Kaneda does not explicitly disclose the transmitting means for the geometric shapes, the transmission of the geometric shapes is necessary in order for comparison and tracking of the shape.

22. Claim 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al. (US Patent # 6,088,060) in view of Williams et al. (US Patent # 6,281,970) and further in view of Xie et al. (US Patent # 5,874,994), and in further view of McIntyre et al. (US Patent # 5,752,115).

23. In regard to claim 51, note the primary reference of Suda in view of Williams and Xie discloses the use of an image analyzing focusing device as claimed in claim 37. Therefore, it can be seen that the primary reference fails to disclose that it sets the focus position to infinity when no object is found in the image. McIntyre discloses that the focus position is set to infinity when no object is found in the image (column 7, lines 1-25). McIntyre teaches that setting the focus position to infinity when no object is found in the image is preferred in order to establish proper focus and capture a clear image (column 7, lines 1-25). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to set the focus position to infinity when no object is found in the image as suggested by McIntyre.

24. Claims 56-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suda et al. (US Patent # 6,088,060) in view of Williams et al. (US Patent # 6,281,970)

25. In regard to claim 56, note Suda discloses a focusing device for an optical apparatus (column 7, lines 16-19; and figure 1: 1) comprising a controllable optical convergence element (column 7, lines 16-19; and figure 1:8), an image detector arranged so as to receive an image of an object projected by the optical convergence element and to generate an image signal based on the received image (column 7, lines 41-45 and figure 1: 2), a processor arranged so as to receive output signals and to generate control signals to control the optical convergence element to focus the image of the object onto the image detector (column 7, lines 41-45; and figure 1: 5, 10, and 7), wherein the processor is constructed and arranged to generate the control signals based on the received output signal that represents at least one image window in the image, the image window representing less than an entirety of the overall image (column 3, lines 57-65 and column 7, lines 31-36; the automatic focusing means uses the calculating means to determine the difference information).

Therefore, it can be seen that Suda fails to disclose the use of radiometric instrumentation connected to received as an input the image signal, the radiometric instrumentation being constructed and arranged to generate a radiometric output signal, that the output signal received by the processor that is used to generate control signals to control the optical convergence element, and that the window is selected based on thermal properties of objects represented in the image as determined by the radiometric instrumentation.

Williams discloses the use of radiometric instrumentation connected to received as an input the image signal (column 7, lines 1-15), the radiometric instrumentation

being constructed and arranged to generate a radiometric output signal (column 7, lines 1-15), that the output signal received by the processor that is used to generate control signals to control the optical convergence element (column 5, lines 33-37; using the detection of a "hot spot" and the calculated location within the imaging area as the signal output to the processor of Suda in order to control optical convergence element), and that the window is selected based on thermal properties of objects represented in the image as determined by the radiometric instrumentation (column 5, lines 33-37; using the detection of a "hot spot" and the calculated location within the imaging area as the signal output to the processor of Suda in order to control selection of the imaging window). Williams teaches that the use of an infrared sensor to detect differences in thermal properties is preferred in order to detect heat such as forest fires in order to observe and research the specific hotspot (column 2, lines 36-47). Therefore, it would have been obvious to one of ordinary skill in the art to modify the primary device to include the use of an infrared sensor and radiometric instrumentation as suggested by Williams.

26. In regard to claim 57, note Williams discloses the detection of an area of the image that is based on the identification of a portion of the image representing a highest temperature (column 3, lines 55-56; the hot spot is considered to be the highest temperature).

27. In regard to claim 58, note Williams discloses the detection of an area of the image that is based on the identification of a portion of the image with respect to the temperature (column 3, lines 55-56; the hotspot is considered to be the highest

temperature), although Williams does not explicitly disclose that the portion of the image is selected based on the lowest temperature, it is merely a matter of design choice (for instance, in the Williams reference, the device is searching for a fire, so based on design choice, if the user wanted to search for an iceberg, it would be an obvious modification to change the temperature range based on the preference of the user in order to select the lowest temperature region; column 8, lines 9-11). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Williams device to search for the lowest temperature based on design choice.

28. In regard to claim 59, note Williams discloses the use of a calibration device, with the radiometric output signal passing through the calibration device before being received by the processor (column 7, lines 1-7 and figure 8: 184 and 200; the calibration device checks the IR signal before sending the output to the processor).

29. In regard to claim 60, note Williams discloses the detection of an area of the image that is based on the identification of a portion of the image with respect to the temperature (column 3, lines 55-56; the hotspot is considered to be the highest temperature), although Williams does not explicitly disclose that the portion of the image is selected based on a predetermined temperature value, it is merely a matter of design choice (for instance, in the Williams reference, the device is searching for a fire, so based on design choice, if the user wanted to search for a person, it would be an obvious modification to change the temperature range based on the preference of the user in order to select a human target based on the temperature of body heat; column 8, lines 9-11). Therefore, it would have been obvious to one of ordinary skill in the art to

modify the Williams device to search for the lowest temperature based on design choice.

30. In regard to claim 61, note Williams discloses the use of a temperature measuring device, and output of which is received as an input by the calibration device (column 7, lines 32-38; the CCD measures the temperature).

Allowable Subject Matter

Claims 10-13 and 27-29 are allowed.

The following is an examiner's statement of reasons for allowance:

As for claims 10, the prior art does not teach or fairly suggest an image focusing device that processes an image to find at least one window to which focusing is to be done dependent upon characteristics within the window, as well as estimating the distance from the device to an object using the temperature and/or position of the optics.

As for claims 27, the prior art does not teach or fairly suggest an image focusing method that processes an image to find at least one window to which focusing is to be done dependent upon characteristics within the window using the function:

$$FMF(z) = \frac{1}{N}\sum(K \otimes I_z - m)^2$$

where K is an operator, N is a factor of normalization, and m is a variable.

Claims 43-46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter:

As for claims 43, the prior art does not teach or fairly suggest an image focusing device that processes an image to find at least one window to which focusing is to be done dependent upon characteristics within the window, as well as estimating the distance from the device to an object using the temperature and/or position of the optics.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chriss S. Yoder, III whose telephone number is (571) 272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CSY
January 18, 2006

NGOC-YEN VU
PRIMARY EXAMINER